NASAfacts

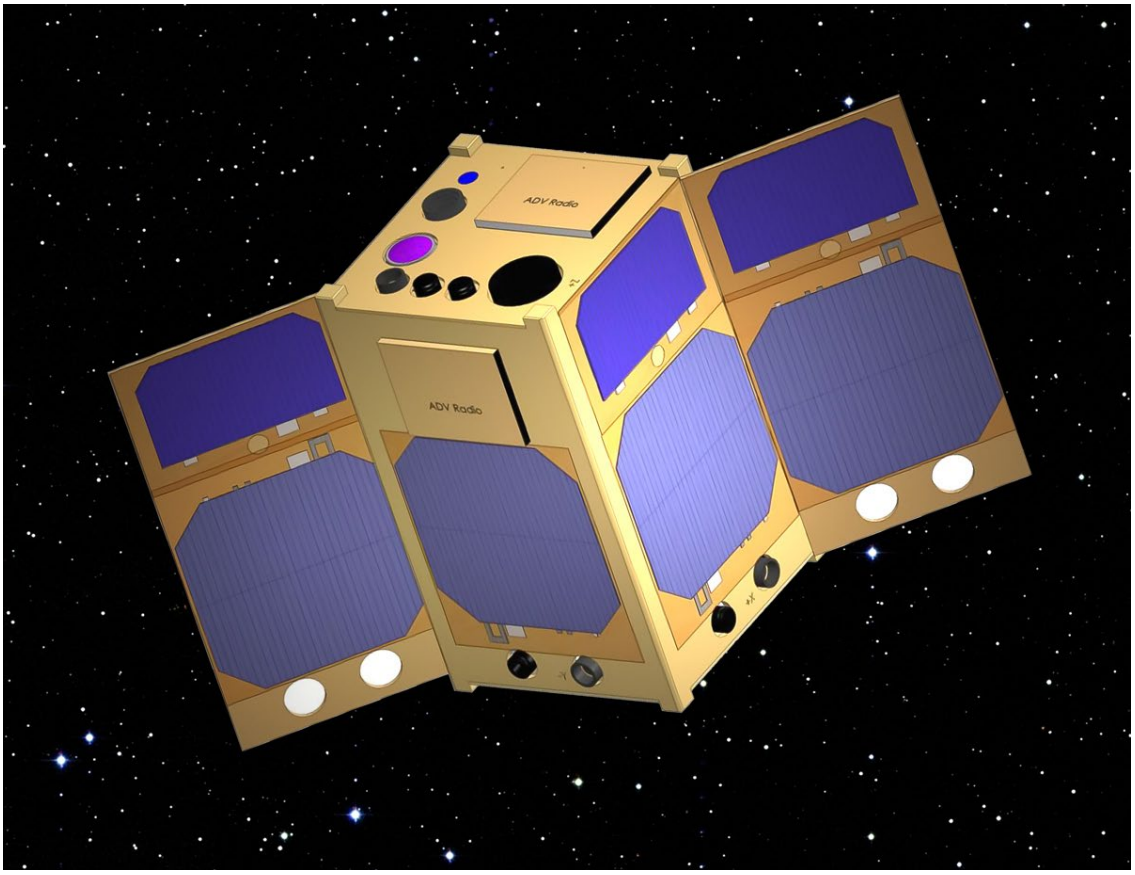
Optical Communications and Sensor Demonstration (OCSD)

Cross-Cutting Technologies for Proximity Operations & Data Transmission

The Optical Communications and Sensor Demonstration (OCSD) mission will address two cross-cutting capabilities of interest to NASA's Small Spacecraft Technology Program (SSTP): demonstration of small spacecraft proximity operations and high-speed optical transmission of data. The OCSD project is under development by the Aerospace Corporation, in El Segundo, California.

Cubesats, due to their small size are characteristically limited in the amount of energy they can collect and store. This results in significant challenges for communications systems, which typically have large power requirements for high bandwidth data transmission capabilities. The OCSD mission will demonstrate the optical technology of laser diodes to transmit spacecraft data, which will be collected and recorded by a telescope system on the ground.

The second OCSD objective addresses the need for low-cost sensors that small spacecraft can use to help them maneuver and operate safely in close proximity to other spacecraft or objects in space. Capabilities in proximity operations will enable multiple small



spacecraft to operate cooperatively during science or exploration missions; to approach another spacecraft or object for in-space observation or servicing, or to connect small spacecraft together to form larger systems or networks in space.

Concept of Operations

The OCSD mission will consist of a pair of one-and-a-half-unit (1.5U) cubesats that will be launched as a secondary payload on a rideshare mission. After launch and deployment the two spacecraft will undergo a checkout period, followed by a proximity operations demonstration, and finally the laser communications demonstration.

OCSD was recently selected for a flight opportunity as part of the CubeSat Launch Initiative in NASA's Human Exploration and Operations Mission Directorate. OCSD's two 1.5U spacecraft will be launched and deployed as an auxiliary spacecraft on a rideshare mission arranged by the Launch Services Program at NASA's Kennedy Space Center. The spacecraft will be launched to Earth orbit in 2015.

The OCSD mission is funded through NASA's Small Spacecraft Technology Program (SSTP) within the new Space Technology Mission Directorate which was formed as a catalyst for the creation of technologies and innovation needed to maintain NASA leadership in space, while also benefiting America's economy. The SSTP was created specifically to develop and demonstrate new technologies and capabilities for small spacecraft.

For more information, contact:

Bruce Yost
Small Spacecraft Technology Program Manager
Space Technology Mission Directorate
NASA Ames Research Center
bruce.d.yost@nasa.gov

Andrew Petro
Small Spacecraft Technology Program Executive
Space Technology Mission Directorate
NASA Headquarters
andrew.j.petro@nasa.gov

National Aeronautics and Space Administration

Ames Research Center
Moffett Field, CA 94035

www.nasa.gov

FS #2013-04-08-ARC